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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/757,392	01/15/2004	You-seop Lee	249/438	4957
27849	7590	08/22/2008	EXAMINER	
LEE & MORSE, P.C.			WEINSTEIN, LEONARD J	
3141 FAIRVIEW PARK DRIVE				
SUITE 500			ART UNIT	PAPER NUMBER
FALLS CHURCH, VA 22042			3746	
			MAIL DATE	DELIVERY MODE
			08/22/2008	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## DETAILED ADVISORY ACTION

### ***Response to Arguments***

1. Applicant's arguments filed July 2, 2008 have been fully considered but they are not persuasive.
2. With respect to the rejection of claims 1, 4, 6-8, 17 and 20 under 35 U.S.C. 102(b) as being anticipated by Tsai et al., "A Thermal Bubble Actuated Micro Nozzle-Diffuser Pump," the applicant argues the following:
  - a. Tsai does not teach the limitations of claim 1 including a fluid entrance with a cross-sectional area that decreases in a direction towards a pump chamber and a fluid ext with a cross-sectional area that increases in a direction toward the a pumping chamber.
    - i. In response to applicant's argument the examiner respectfully disagrees and asserts that the limitations of claim 1 are sufficiently broad to allow for any port, conduit, or opening in which fluid flows into or out of a pump chamber to be an inlet or an outlet respectively. The limitations recite "a least one fluid entrance and at least one fluid exit... connected directly between the pumping chamber and a respective manifold." Tsai teaches that a diffuser valve allows for an amount of backflow of fluid into a pumping chamber when a bubble in the pumping chamber shrinks. The limitations do not require an entrance to a pump chamber to communicate with a fluid inlet to a pumping unit or a structure where the net fluid flow is into a pump chamber. The limitations of claim 1 require an entrance

which allows fluid to flow into a pumping chamber, the volume fluid does not have to be greater than fluid flow out of an exit to the pumping chamber.

b. The examiner's interpretation of Tsai for the purposes of the rejection of claim 4 conflicts with the examiner's interpretation of the same subject matter for the purposes of the rejection of claim 1.

i. With respect to applicant's argument the examiner disagrees and reiterates that the limitations of claim 1 as well as claim 4 are sufficiently broad and encompass any port, conduit, or opening in which fluid flows into or out of a pump chamber to be an inlet or an outlet respectively. The examiner also points out the applicant's own usage of the term "blackflow" to characterize the action of fluid in Tsai and notes that the term describes a flow of fluid *into* a chamber. Thus the structure facilitating the "backflow" could reasonably be considered to be a fluid inlet permitting fluid into a pumping chamber at the point in time when the "backflow" occurred during normal operation.

c. The examiner's rejection of claim 1 is based on an interpretation that is inconsistent with the applicant's disclosure and that specifically one of ordinary skill in the art would interpret a fluid entrance to a pump chamber in terms of net fluid flow.

i. The examiner respectfully disagrees with the applicant's argument and asserts that one of ordinary skill in the art would equate an entrance

or fluid inlet with any structure that permits fluid to flow into another body, object, chamber, etc. The examiner declines to import limitations from the specification into claim 1. An inlet, permits fluid to flow into another object, irrespective of what any other element associated with the same object may be doing. It is also noted by the examiner that at least a portion of fluid that flows into the pumping chamber of Tsai through the diffuser valve when a bubble shrinks part of the fluid that will be pumped out the fluid chamber subsequent to the next pump expansion. As such the diffuser serves the purpose of allowing a flow of fluid into a chamber that will then be pumped out of the chamber and acts as an inlet. Similarly when a bubble expands in a chamber fluid is permitted to flow out the chamber through the nozzle valve of Tsai and thus provides a fluid exit.

d. Tsai fails to teach a circular shaped heating element and the examiner's interpretation of the heating element shown in figure 2 of Tsai and one of ordinary skill in the art would not consider the meander shaped heater of Tsai as being circular in shape.

i. The examiner notes that in the rejection of the claim 4 the examiner cited figure 3 (b) of Tsai as teaching a circular shaped heating element. The examiner agrees that a single "meander" of a serpentine heating element that is shown in figure 2 of Tsai does not read on the claimed limitations. However figure 3 (b) of Tsai shows that meander shaped

heating element is configured in a circular arrangement and clearly anticipates the claimed limitations.

3. With respect to the rejection of claims 1, 6-9, 11-16 and 18 under 35 U.S.C. 102

(b) as being anticipated by Baughman et al. US 5,387,314 the applicant argues that Baughman fails to teach a fluid exit with cross-sectional that varies along a direction of fluid flow to have a constant inclination angle along its entire length.

a. The examiner respectfully disagrees with the applicant's argument and asserts that the shape of the wall of the fluid exit taught in Baughman is disclosed as being formed by a "convergent bore" (col. 3 ll. 67). The figures cited by the applicant show a nozzle 20 that would appear to have an angle of curvature along its length but the examiner asserts that Baughman's disclosure suggest that this wall could be formed as either a flat surface or having an arc and satisfy the requirements of the disclosure that the nozzle form a "convergent bore." One of ordinary skill in the art would understand this disclosure to include a cone shape nozzle which would meet the requirement to have a fluid exit with a constant angle of inclination along a cross-sectional area that varies along a path of fluid flow.

4. With respect to the finality of the prior office action that applicant argues that the subject matter recited in claims 1 and 4, as amended in applicant's previous response, was already under examination and new grounds of rejection were not necessitated by the amendments to those claims.

a. The amendments made to claims 1 and 4 in the response of March 3, 2008 presented new limitations with respect to claims 6-20 and claim 5 respectively. Therefore the examiner maintains the finality of the prior office action.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEONARD J. WEINSTEIN whose telephone number is (571)272-9961. The examiner can normally be reached on Monday - Thursday 7:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571) 272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Leonard J Weinstein/  
Examiner, Art Unit 3746

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/Devon C Kramer/  
Supervisory Patent Examiner, Art Unit 3746